UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/639,144	08/11/2003	Chun Chian Lu	06720.0104-00	7607

22852   7590   09/19/2007
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER
LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

EXAMINER
ZHENG, EVA Y

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
09/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

10

	Application No.	Applicant(s)
Office Action Summary	10/639,144	LU, CHUN CHIAN
	Examiner	Art Unit	
	Eva Yi Zheng	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>23 July 2007</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Request for Continued Examination

1.   The request filed on July 23, 2007, for a Request for Continued Examination (RCE) under 37 CFR 1.114 based on parent Application No. 10/639,144 is acceptable and a RCE has been established. An action on the RCE follows.

Response to Arguments

2.   Applicant's arguments filed 7/23/07 have been fully considered but they are not persuasive.

Applicant's argument – (1) Prior art by Hafeez failed to teach "obtaining an approximation of the pulse shaping distortion" as claimed. (2) Hafeez failed to teach "non-channel distortion".

Examiner's response – (1) Hafeez discloses an estimation of the pulse shape response in a wireless receiver, wherein the received signal is input to a pulse-shape filter and then to a pulse shape estimator. The pulse-shape response estimate can also be used to compensate for pulse-shape distortion (Col 8, L12-15). It is clear that both pulse shape filter and pulse shape estimator perform mathematical calculations on pulse shaping distortion of the received signal. (2) "non-channel distortion" is interpreted as distortion produced by non-channel function by examiner. The non-channel function is pulse shaping (PS) function according to the current application specification ([0026]). Therefore, Hafeez's pulse-shape filter and pulse shape estimator meet the claimed limitation.

Claim Objections

3.   Claims 9 and 18 are objected to because of the following informalities: limitation:

"non-channel distortion" is interpreted as distortion produced by non-channel function by

examiner. Please verify if this interpretation is incorrect.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5.   Claims 1-5, 8-14, 16, and 18-19 are rejected under 35 U.S.C. 102(e) as being

unpatentable by Hafeez et al. (US 6,920,191).

a)   Regarding to claim 1, Hafeez et al disclose a signal processing method

comprising:

. receiving a first wireless communication signal, the first signal including distortion

produced by pulse shaping (signal received from antenna 102 in Fig. 3; it is inherent

that distortions are introduced along with received signals);

obtaining an approximation of the pulse shaping distortion (106,108,109 and 112

in Fig. 3);

separating the approximation of the pulse shaping distortion from the first signal

to obtain a second signal (316 in Fig. 3; Col 9, L19-25); and

processing the second signal to obtain a user signal ($\hat{a}_n$; abstract).

b)   Regarding to claim 2, Hafeez et al disclose further comprising:

conducting a signal-user detection (wireless communication system; Col 1, L6-

16); and

obtaining an amplitude estimate and a symbol delay for a user in a frame (113

and 314 in Fig. 3).

c)   Regarding to claim 3, Hafeez et al disclose wherein the second signal has

insignificant or no pulse shaping effects (pulse shaping distortion compensation;

abstract; Col 8, L12-14).

d)   Regarding to claim 8, Hafeez et al disclose wherein separating the approximation

of the pulse shaping distortion from the first signal comprises separating an

approximately known function of pulse shaping from an unknown function with a time-

varying channel function (Col 6, L1-Col 7, L19).

e)   Regarding to claim 9, Hafeez et al disclose a signal processing method

comprising:

receiving a first wireless communication signal, the first signal including distortion

produced by a non-channel function (signal received from antenna 102 in Fig. 3; it is

inherent that distortions are introduced along with received signals);

obtaining an approximation of the non-channel distortion (106,108,109 and 112

in Fig. 3);

separating the approximation of the non-channel distortion from the first signal to obtain a second signal that includes a time-varying channel function (316 in Fig. 3; Col 9, L19-25); and

processing the second signal to obtain a user signal ($\hat{a}_n$; abstract).

f)   Regarding to claim 10, Hafeez et al disclose wherein the non-channel function comprises a transformation function (106 and 108 in Fig. 3).

g)   Regarding to claim 11, Hafeez et al disclose further comprising:

conducting a signal-user detection (wireless communication system; Col 1, L6-16); and

obtaining an amplitude estimate and a symbol delay for a user in a frame to obtain the approximation of the non-channel distortion (113 and 314 in Fig. 3).

h)   Regarding to claim 12, Hafeez et al disclose wherein the second signal has insignificant or no non-channel distortion (pulse shaping distortion eliminated by 316 in Fig. 3; abstract; Col 8, L12-14).

i)   Regarding to claim 16, Hafeez et al disclose wherein separating the approximation of the non-channel distortion from the first signal comprises separating an approximately known non-channel distortion from an unknown distortion of a time-varying channel function (Col 6, L1-Col 7, L19).

j)   Regarding to claim 18, Hafeez et al disclose a signal processing system, comprising:

a receiver for receiving a first signal for wireless communication (signal received from antenna 102 in Fig. 3);

a tracking device for obtaining an amplitude estimate and a symbol delay for a

user (106,108,109,113 and 314 in Fig. 3);

an approximating device, coupled to the tracking device, for providing an

approximation of distortion produced by a non-channel function in the first signal (112 in

Fig. 3; Col 8, L12-14); and

a signal-separating device, coupled to the approximation device, for separating

the approximation of the non-channel distortion from the first signal to obtain a second

signal that includes a time-varying channel function (316 in Fig. 3; Col 9, L19-25).

k)   Regarding to claim 19, Hafeez et al disclose wherein the non-channel function

comprises a transformation function (106 and 108 in Fig. 3).

l)   Regarding to claims 4 and 13, Hafeez et al disclose wherein separating the

approximation of the pulse shaping distortion from the first signal comprises applying an

equalization between the second signal and an original signal before pulse shaping

(LMS Col 7, L16-20).

m)   Regarding to claims 5 and 14, Hafeez et al disclose wherein separating the

approximation of the pulse shaping distortion from the first signal comprises applying a

decision feedback equalization between the second signal and an approximation of an

original signal before pulse shaping based on a current decision (DFE use LMS

algorithm; Col 7, L16-20; pulse shape filter 106 perform approximation on the original

signal).

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

7.   Claims 6-7, 15, 17, and 20 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Hafeez et al. (US 6,920,191) in view of Shattil (Pub No.: US

2002/0034191).

Regarding to claims 6-7, 15, 17, and 20, Hafeez et al. disclose wherein

separating the approximation of the pulse shaping distortion from the first signal

comprises applying an equalization (LMS Col 7, L16-20), and all the subject matters

above except for the specific teaching of at least one order of perturbation to adjust the

approximation of the pulse shaping distortion.

However, Shattil disclose a wireless communication system comprise an

approximate solution that is obtained from a first-order perturbation calculation ([0678]).

Therefore, it is obvious to one of ordinary skill in art to combine the teaching of

perturbation algorithm taught by Shattil in the pulse shaping distortion compensator of

Hafeez et al. By doing so, provide interference improvement in a wireless

communication system.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Y Zheng whose telephone number is 571-272-3049. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eva Yi Zheng
Examiner
Art Unit 2611

September 4, 2007

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER